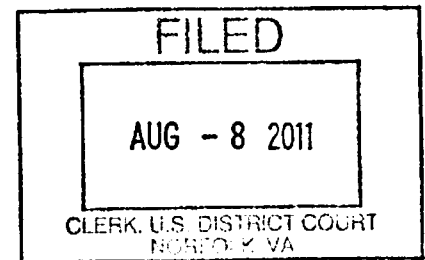


UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF VIRGINIA  
Norfolk Division



THE FOX GROUP, INC.,

Plaintiff,

v.

ACTION NO. 2:10cv314

CREE, INC.,

Defendant.

OPINION AND FINAL ORDER

This matter comes before the court on Cree, Inc.'s ("Cree") Motion for Summary Judgment of non-infringement of U.S. Patent Number 6,562,130 ("the '130 patent") and U.S. Patent Number 6,534,026 ("the '026 patent") and invalidity of the '130 patent ("Cree's Summary Judgment Motion"). For the reasons set forth below, Cree's Summary Judgment Motion is **GRANTED** in part, and **DENIED**, in part, as **MOOT**.

**I. Background<sup>1</sup>**

This case involves Cree's alleged infringement of the '130 and '026 patents, which are owned by The Fox Group, Inc. ("Fox") and relate to growth of low defect silicon carbide (SiC) through "seeded

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<sup>1</sup> Much of the relevant background recited herein is also set forth in the court's June 10, 2011, claim construction Opinion, The Fox Group, Inc. v. Cree, Inc., -- F. Supp. 2d --, 2011 WL 2308694, at \*1-2 (E.D. Va. 2011), and in the court's July 20, 2011, Memorandum Opinion and Order. The Fox Group, Inc. v. Cree, Inc., -- F. Supp. 2d --, 2011 WL 2963580, at \*1 (E.D. Va. 2011).

sublimation.”<sup>2</sup> SiC crystal is a semiconductor material grown via man-made methods and used in high-temperature and high-power electronics such as light sources, power diodes, and photodiodes. To be viable as a semi-conductor, SiC material must contain a relatively low level of defects.

Fox filed suit against Cree on June 29, 2010, seeking injunctive relief against alleged patent infringement, as well as compensatory damages.<sup>3</sup> Fox alleges that “Cree has been making, using, selling, and/or offering for sale silicon carbide substrates and products that use silicon carbide that practice the invention of the ‘026 patent [and the ‘130 patent], and thus, infringe one or more claims of [those patents.]” Compl. ¶¶ 21 and 34, ECF No. 1. Fox also alleges that Cree will continue to infringe those patents unless enjoined by the court. Id. ¶¶ 22 and 35. On August 30, 2010, Cree answered the Complaint and filed counterclaims against Fox seeking declarations

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<sup>2</sup> Seeded sublimation involves the growth of “single crystal SiC . . . in crucibles under high heat. Specifically, a ‘seed’ crystal of SiC is inserted into a crucible along with SiC ‘source’ material -- typically SiC powder. Heat is applied to the crucible, causing the SiC source material to sublime -- turn from solid to gas -- and then condense on the seed, thereby growing a single crystal SiC material that can be processed into semiconductors for electronic devices.” Fox Group, 2011 WL 2308694, at \*1.

<sup>3</sup> Fox originally brought suit against Cree and Dow Corning Corp. On October 25, 2010, the action against Dow Corning was transferred to the district court for the Southern District of New York. See The Fox Group, Inc. v. Cree, Inc., 749 F. Supp. 2d 410, 417 (E.D. Va. 2010).

that the claims of the '026 and '130 patents are (1) not infringed, (2) invalid, and (3) unenforceable. See Answer ¶¶ 126-135, ECF No. 12.

On April 11, 2011, Cree filed its Summary Judgment Motion. On April 25, 2011, Fox responded in opposition, and, on May 2, 2011, Cree replied. On June 10, 2011, the court issued its claim construction Opinion, in which it construed four (4) disputed terms and phrases from the '130 patent and seven (7) disputed terms and phrases from the '026 patent. See The Fox Group, Inc. v. Cree, Inc., -- F. Supp. 2d --, 2011 WL 2308694, at \*6-23 (E.D. Va. 2011). In light of the court's claim construction, on June 28, 2011, Fox filed a Motion for Entry of Partial Summary Judgment of Non-Infringement of the '026 patent, and Dismissal Without Prejudice of Related Counterclaims ("Fox's Summary Judgment Motion").

On July 8, 2011, the court issued an order removing the trial date from the calendar pending resolution of Fox and Cree's respective summary judgment motions. The court also granted Cree's July 6, 2011, motion seeking leave to file a supplemental memorandum in further support of its Summary Judgment Motion, and directed that Fox may submit a supplemental opposition brief and that Cree may submit a supplemental reply brief. On July 13, 2011, Fox responded in opposition to Cree's supplemental memorandum, and, on July 18,

2011, Cree filed its supplemental reply. Cree's Summary Judgment Motion is fully briefed and ripe for review.

On July 20, 2011, the court granted Fox's Summary Judgment Motion, and, accordingly, entered judgment of non-infringement of the '026 patent for Cree and dismissed Cree's counterclaims related to the '026 patent. The Fox Group, Inc. v. Cree, Inc., -- F. Supp. 2d --, 2011 WL 2963580, at \*3 (E.D. Va. 2011). Cree's Summary Judgment Motion is, therefore, **DENIED**, as **MOOT**, insofar as it seeks judgment of non-infringement of the '026 patent. Accordingly, the only issue before the court is whether there is a genuine issue of material fact concerning invalidity and non-infringement of the '130 patent.

## II. The Asserted Claims<sup>4</sup>

Fox alleges that Cree infringes claims 1 and 19 of the '130 patent.<sup>5</sup> Claim 1 asserts:

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<sup>4</sup> The court only addresses the claims of the '130 patent, as the '026 patent is no longer a subject of this litigation. See Fox Group, 2011 WL 2963580, at \*3.

<sup>5</sup> The parties disputed the construction of terms and phrases that are also found in claims 7 and 13, see Fox Group, 2011 WL 2308694, at \*2 and \*6, but Fox has never indicated that Cree infringes those claims. Rather, Fox avers that Cree's products contain a density of dislocations below 10,000, the dislocation threshold found only in claims 1 and 19. See, e.g., Compl. ¶ 38 (referencing a chart "depicting that Cree is infringing at least claim 1 of the '130 patent"); Fox's Supplemental Br. in Opp. to Mot. for Summ. J. 2 n.2, ECF No. 522 (claiming that Fox's expert's "opinions establish that

A silicon carbide material comprising an axial region of re-crystallized single crystal silicon carbide with a density of dislocations of less than  $10^4$  per square centimeter, a density of micropipes of less than 10 per square centimeter, and a density of secondary phase inclusions of less than 10 per cubic centimeter.

See '130 patent col.8 ll.6-11, Ex. I to Compl., ECF No. 1-9 [hereinafter "'130 patent"]. Claim 19 requires "silicon carbide material" having the same density of dislocations, the same density of micropipes, and the same density of secondary phase inclusions as required by claim 1. Unlike claim 1, however, claim 19 requires a "silicon carbide seed crystal," id. col.9 l.38, and "a region of axially re-crystallized silicon carbide . . . initiating at [the] growth surface of . . . [the] seed crystal." Id. cols.9 l.41 - 10 l.1. The differences in claim 19 as compared to claim 1 are underscored below for ease of comparison:

19. A silicon carbide material, comprising:

A single crystal silicon carbide seed crystal, said single crystal silicon carbide seed crystal having a growth surface; and

A region of axially re-crystallized silicon carbide, said region of axially re-crystallized silicon carbide initiating at said growth surface of said single crystal silicon carbide seed crystal, said region of axially re-crystallized silicon carbide having a density of

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the surface of an axial region of each category of Cree's as-grown wafers . . . has a density of dislocations of less than  $10^4$  per  $\text{cm}^2$ "); id. at 5-6, 14; see also id. at 11 ("The issue of infringement has narrowed to the density of dislocations limitation.").

dislocation of less than  $10^4$  per square centimeter, a density of micropipes of less than 10 per square centimeter, and a density of secondary phase inclusions of less than 10 per cubic centimeter.

Id. cols.9 1.37 - 10 1.6 (emphasis added).

### III. Claim Construction

On June 10, 2011, the court construed the '130 patent's disputed terms and phrases as follows:

- (1) "Axial region of re-crystallized single crystal silicon carbide" / "region of axially re-crystallized silicon carbide" means "portion of a silicon carbide crystal that is grown in a direction substantially perpendicular to the seed crystal plane by heating solid silicon carbide to form a vapor that then condenses onto the seed crystal."
- (2) "Density of dislocations" means "concentration of those defects in which lines of atoms in a crystal structure are displaced, including screw, edge, and basal plane dislocations."
- (3) "Density of micropipes" means "concentration of micropipes."<sup>6</sup>
- (4) "Density of secondary phase inclusions" means "concentration of polytypes different than the polytype of the silicon carbide crystal material and/or precipitates of material such as silicon, carbon, and tantalum or niobium, and their compounds."

Fox Group, 2011 WL 2308694, at \*22. In reaching the above constructions, the court made three findings relevant to the issue of invalidity. First, the court rejected Cree's position that there

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<sup>6</sup> "The parties agreed that the term 'micropipes' should be construed as 'screw dislocations with empty cores, also called microtubes, micropores, or pores.'" Fox Group, 2011 WL 2308694, at \*10 (citations omitted).

can be only one axial region in the SiC material grown via the method and apparatus described in the '130 patent. See id. at \*7-8. Instead, the court agreed with Fox that the '130 patent "claims one or more axial regions in the SiC material that meet the claimed defect densities, while allowing for other axial regions in that same SiC material that do not meet those same claimed defect densities." Id. at \*8. Second, the court found that "the clear and consistent description of the invention is a method directed toward growth of low defect SiC," id., through seeded sublimation. See id. at \*1-2.

Finally, the court rejected reading the claims to require a particular technique for quantifying the defects in an axial region of re-crystallized single crystal SiC. "Fox argue[d] that only those defects intersecting the surface of an axial region should be counted toward the defect thresholds specified in the claims," id. at \*9, whereas Cree advocated a method that measures defects intersecting an axial region's surface, as well as defects entirely beneath the surface. The court expressed no opinion regarding the propriety of any counting method, let alone those forwarded by the parties.<sup>7</sup> Rather, the court found that the '130 patent only

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<sup>7</sup> This point was evidently lost on the parties. Cree insists that the court's claim construction "unequivocally requires the inclusion of both surface and non-surface dislocations for the purposes of determining the claimed dislocation density," Cree's Supplemental Br. in Supp. of Mot. for Summ. J. 11, ECF No. 423, whereas Fox insists

indicates that an axial region must meet the claimed defect densities, and so "the proper measurement technique . . . is a matter to be resolved by the trier of fact." Id. at \*10 n.20; see id. at \*9 ("The only permissible inference is that . . . the patent is concerned with the extent to which defects are present in an axial region."). In other words, it is an open question whether a SiC material containing an axial region with a dislocation density throughout its entire volume that exceeds the '130 patent's dislocation density thresholds can nonetheless infringe that patent. See id. at \*9 ("[E]ven if a one cubic centimeter axial region contains  $10^5$  dislocations below its surface, it can still satisfy claim 1's  $10^4$  per square centimeter limitation [under Fox's preferred measurement technique]."). Similarly, it is an open question whether a SiC material containing an axial region with a dislocation density on its surface that is within the '130 patent's dislocation density thresholds can nonetheless not infringe that patent. See id. ("[I]f a one cubic centimeter axial region contains  $10^5$  . . . dislocations below the surface, it cannot satisfy claim 1's  $10^4$  per square centimeter limitation [under Cree's preferred measurement

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that the court "expressly rejected the measurement method that Cree claimed was required." Fox's Supplemental Br. in Opp. to Mot. for Summ. J. 5. Both parties are mistaken. The court rejected the proposition that it could adopt any claim construction that promotes or rejects a particular measurement technique.



technique], even if those dislocations are not detectable on the surface." ). The only certainty in this regard from the court's claim construction is that an axial region with a dislocation density throughout its entire volume that is within the '130 patent's dislocation density thresholds necessarily infringes the patent.<sup>8</sup>

The court specifically relies upon these findings, as well as the general reasoning underlying its claim construction, in deciding the motion before it.

#### IV. Standard of Review

Summary judgment is appropriate when a court, viewing the record as a whole and in the light most favorable to the nonmoving party, finds that there is no genuine issue of material fact and that the moving party is entitled to judgment as a matter of law. See Fed. R. Civ. P. 56(a); Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248-50 (1986). On summary judgment, the court is "not [] to weigh the evidence and determine the truth of the matter." Id. at 249. Instead, the court will draw any permissible inference from the underlying facts in the light most favorable to the nonmoving party. See Matsushita Elec. Indus. Co., Ltd. v. Zenith Radio Corp., 475 U.S.

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<sup>8</sup> For instance, if the concentration of dislocations throughout the volume of a one cubic centimeter axial region is 9,000, that region necessarily could not have more than 9,000 dislocations intersecting its surface, nor could it have more than 9,000 dislocations beneath its surface.

574, 587-88 (1986); Steelman v. Hirsch, 473 F.3d 124, 127 (4th Cir. 2007). But a failure by the non-moving party to rebut a summary judgment motion with sufficient evidence will result in summary judgment when appropriate. "[T]he plain language of Rule 56[] mandates the entry of summary judgment, after adequate time for discovery and upon motion, against a party who fails to make a showing sufficient to establish the existence of an element essential to that party's case, and on which that party will bear the burden of proof at trial." Celotex Corp. v. Catrett, 477 U.S. 317, 322 (1986).

#### V. Analysis

Cree seeks summary judgment regarding the '130 patent on two grounds: invalidity and non-infringement. The court first addresses invalidity, and then, to the extent necessary, the issue of non-infringement. See, e.g., Optivus Tech., Inc. v. Ion Beam Applications S.A., 469 F.3d 978, 991 (Fed. Cir. 2006) ("Having affirmed the judgment of invalidity, we need not address the judgment of non-infringement." (citations omitted)); TypeRight Keyboard Corp. v. Microsoft Corp., 374 F.3d 1151, 1157 (Fed. Cir. 2004) ("[A] judgment of invalidity necessarily moots the issue of infringement." (citations omitted)).

## A. Invalidity

### 1. Standard for Patent Invalidity

Under the Patent Act, "[a] person shall be entitled to a patent unless . . . before such person's invention thereof, the invention was made in this country by another inventor who had not abandoned, suppressed, or concealed it." 35 U.S.C. § 102(g)(2). In other words, "if a patentee's invention has been made by another, prior inventor who has not abandoned, suppressed, or concealed the invention, § 102(g) will invalidate the patent." Apotex USA, Inc. v. Merck & Co., 254 F.3d 1031, 1035 (Fed. Cir. 2001) (citations omitted). Invalidity under § 102(g)(2) can be a defense to an infringement suit. See id.

In order to prove invalidity under § 102(g)(2), a defendant must establish prior invention by clear and convincing evidence. Dow Chem. Co. v. Astro-Valcour, Inc., 267 F.3d 1334, 1339 (Fed. Cir. 2001). "[A] challenger . . . has two ways to prove that it was the prior inventor: (1) it reduced its invention to practice first . . . or (2) it was the first party to conceive of the invention and then exercised reasonable diligence in reducing that invention to practice." Mycogen Plant Sci. v. Monsanto Co., 243 F.3d 1316, 1332 (Fed. Cir. 2001) (citations omitted). Cree asserts prior invention by reduction to practice. "In order to establish an actual reduction

to practice, the inventor must prove that: (1) he constructed an embodiment . . . that met all the limitations of the [patent's claims]; and (2) he determined that the invention would work for its intended purpose." Cooper v. Goldfarb, 154 F.3d 1321, 1327 (Fed. Cir. 1998) (citations omitted). "[D]etermining that the invention will work for its intended purpose may require testing." Id.

Once prior invention is established by clear and convincing evidence, "the burden of production shifts to the patentee to produce evidence sufficient to create a genuine issue of material fact as to whether the prior inventor abandoned, suppressed, or concealed the invention." Dow Chem., 267 F.3d at 1339. If the patentee comes forward with sufficient evidence, "the challenger may rebut the evidence of abandonment, suppression, or concealment, with clear and convincing evidence to the contrary." Id. (citing Apotex, 254 F.3d at 1037-38).

## **2. Cree's Invention**

Cree must prove that it was the prior inventor of the invention underlying the '130 patent. The '130 patent claims priority to application No. PCT/RU97/00005, which was filed on January 22, 1997 and issued as U.S. Patent No. 6,621,363. Cree believes it is a prior inventor because in 1995 four Cree engineers grew a boule of low defect SiC material through seeded sublimation that met the '130

patent's defect density limitations. From that boule, Cree highlights wafer no. G0259-3, which contains an axial region of one square centimeter that meets each of the defect limitations in claims 1 and 19 of the '130 patent. Cree's breakthrough was publicly disclosed through a presentation and paper at the 1995 International Conference on Silicon Carbide and Related Materials in Kyoto, Japan ("The 1995 International Conference"). The paper was then published in 1996. Citing exhibits submitted in support of its Summary Judgment Motion, Cree avers "four key facts" that establish prior invention:

- (1) Cree scientists Dr. [C. H.] Carter[, Jr.] and Dr. [V. F.] Tsvetkov actually made the G0259-03 wafer by 1995 and Prof. [Michael] Dudley characterized the wafer in 1995 by x-ray topography analysis. . . .
- (2) Dr. Carter and Tsvetkov recognized in 1995 that they made a silicon carbide wafer with low defect density. Dr. Carter publicly reported that recognition at [the 1995 International Conference] where he presented a photo of the G0259-3 wafer. The Cree scientists also published an article in 1996 with the photo of the wafer. Contemporaneous x-ray topography photos of Wafer No. G0259-3 are an exact match for the photo in the article. In a section of the article . . . Cree scientists identified that the wafer included a region having a low "total line defect density of about  $1000 \text{ cm}^{-2}$ ". . . .
- (3) As a matter of scientific fact, the G0259-3 wafer that was made by 1995 possessed a region with a one square centimeter area that met all limitations of claims 1 and 19 of the '130 patent. Prof. Dudley analyzed the wafer by x-ray topography in 1995 and concluded that it had low defect density. In 2011, he reviewed

the x-ray topography data, taken in 1995, and confirmed that Wafer No. G0259-3 had a one square centimeter area with no micropipes, no secondary phase inclusions, and less than 10,000 total dislocations. . . .<sup>9</sup>

- (4) It is also undisputed that Cree published an article with a photo of Wafer No. G0259-03 . . . .

Cree's Supplemental Br. in Supp. of Mot. for Summ. J. 15-17, ECF No. 423 (citations omitted); see Cree's Mem. in Supp. of Mot. for Summ. J. ¶¶ 17-25, ECF No. 150 (listing the same in Cree's original statement of undisputed facts).

### 3. Reduction to Practice

"As an initial matter," Fox disputes that Carter and Tsvetkov made the G0259-3 wafer on the basis that Carter did not grow the SiC material from which it was cut and neither scientist could identify the material's inventor. See Fox's Supplemental Br. in Opp. to Mot. for Summ. J. 19, ECF No. 522 (citing Carter Dep. at 63, Ex. 8 to Rudiger Decl., ECF No. 523-8). This objection is meritless. At his deposition, Carter identified himself and Tsvetkov as the inventors, and Tsvetkov as the scientist who grew the low-defect SiC boule. Fox does not offer any evidence, nor credibly highlight any material in the record, that indicates there is a genuine issue that, in 1995, Cree scientists created that boule. Accordingly, there is no genuine issue that Cree is the inventor of the SiC material from which

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<sup>9</sup> See supra note 8 and accompanying text.

the G0259-3 wafer was cut.

Turning to the reduction to practice test, Fox does not genuinely dispute that the G0259-3 wafer meets all of the defect limitations in claims 1 and 19 of the '130 patent.<sup>10</sup> See Fox's Supplemental Br. in Opp. to Mot. for Summ. J. 21 ("Whether or not Prof. Dudley can show, based on testing he conducted in March of 2011, that the G0259-3 wafer meets all three limitations of the '130 patent claims is irrelevant."). Rather, Fox seeks to defeat Cree's Summary Judgment Motion by arguing the other prong of the test: "contemporaneous recognition and appreciation of the invention" represented by claims 1 and 19 of the '130 patent. Mycogen, 243 F.3d at 1335 (emphasis in original) (internal quotation marks and citations omitted). Indeed, Fox does not offer any evidence to rebut Dudley's analysis of the G0259-3 wafer, let alone contend that Dudley's conclusions are erroneous. Accordingly, "the portion of the reduction to practice test requiring that all limitations of the

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<sup>10</sup> In determining whether a genuine issue of material fact exists, "the Court may assume that facts identified by the moving party in its listing of material facts are admitted, unless such a fact is controverted in the statement of genuine issues filed in opposition to the motion." E.D. Va. Loc. Civ. R. 56(B); see also Fed. R. Civ. P. 56(e). In Fox's first opposition brief, it objected to Dudley's 2011 analysis of the G0259-3 wafer because Fox had not yet had an opportunity to investigate Dudley's claims, and, thus, requested the opportunity to depose Dudley regarding his declaration. Fox subsequently took Dudley's deposition, and did not renew or recast an objection to Dudley's conclusions regarding the G0259-3 wafer in its supplemental opposition brief.

count be met has been satisfied." Id.

Turning to the appreciation prong, there is no dispute that if Cree appreciated the invention back in 1995, then Cree reduced it to practice before Fox did so. Fox first argues that Dudley's 2011 analysis is irrelevant to this prong because it "cannot establish conception and appreciation of the invention by the alleged Cree 'inventors' 16 years earlier, in 1995." Fox's Supplemental Br. in Opp. to Mot. for Summ. J. 21. Fox is correct. "[T]he date of the conception of a prior inventor's invention is the date the inventor first appreciated the fact of what he made." Dow Chem., 267 F.3d at 1341 (providing that the challenger must prove that it "recognized and appreciated [the] new form," contemporaneous with its invention (internal quotation marks and citations omitted)). Accordingly, the fact that Dudley's 2011 analysis allows Cree to appreciate in 2011 that the G0259-3 wafer met the defect limitations in claims 1 and 19 of the '130 patent is irrelevant. Fox attacks a "straw man," though, as Cree only argues that Dudley's 2011 analysis proves the first prong of the reduction to practice test -- that the G0259-3 wafer embodies the limitations set forth in claims 1 and 19 of the '130 patent. Cree points to other evidence in the record to establish recognition and appreciation. See, e.g., Cree's Mem. in Supp. of Mot. for Summ. J. 23 (citing Dudley's declaration that he



analyzed the G0259-3 wafer in 1995); Cree's Supplemental Br. in Supp. of Mot. for Summ. J. 15 (citing Carter's deposition testimony on the subject of his communications with Dudley regarding Dudley's 1995 characterization of the G0259-3 wafer).

Fox next argues that Cree cannot prove appreciation because Dudley's 1995 analysis, unlike his 2011 analysis, did not measure each of the defect densities that are claimed in the '130 patent, and it was not enough that Cree appreciated in 1995 that it invented a SiC material with a drastically reduced defect level. In other words, Fox claims that Cree could not "underst[and] [its] creation to have the features that comprise the ['130 patent]," Invitrogen Corp. v. Clontech Labs., Inc., 429 F.3d 1052, 1064 (Fed. Cir. 2005), because Dudley's 1995 analysis of the G0259-3 wafer did not identify an axial region with "a density of dislocations of less than  $10^4$  per square centimeter, a density of micropipes of less than 10 per square centimeter, and a density of secondary phase inclusions of less than 10 per cubic centimeter." '130 patent col.8 ll.7-11; see id. cols.10 ll. 2-6. Fox holds Cree to an unreasonably stringent standard, which this court rejects in light of prevailing precedent.

Federal Circuit law is clear that in order for "the inventor's understanding [to] reach[] the level needed for appreciation," Invitrogen, 429 F.3d at 1064, he is "not require[d] . . . [to]

establish that he recognized the invention in the same terms as those recited [in the patent's claims]." Dow Chem., 267 F.3d at 1341 (internal quotation marks and citations omitted). "The invention is not the language of the [claims] but the subject matter thereby defined." Id. (emphasis added) (internal quotation marks and citations omitted). As this court previously recognized, "the clear and consistent description of the ['130 patent's] invention is a method directed toward growth of low defect SiC." Fox Group, 2011 WL 2308694, at \*8; see id. at \*1 ("The general growth method at issue here is seeded sublimation . . . ."); see '130 patent col.3 ll.10-14 ([W]hat is needed in the art is a method and system that allows high quality SiC single crystals to be grown. The present invention provides such a method and system." (emphasis added)). Accordingly, in order to establish the appreciation prong by clear and convincing evidence, Cree does not need to offer evidence that its scientists were aware that an axial region in the G0259-3 wafer specifically met each of the defect limitations set forth in claims 1 and 19 of the '130 patent. Rather, Cree must establish that its inventors appreciated the novelty of the low defect Si material they grew through seeded sublimation. See Dow Chem., 267 F.3d at 1341 ("It is enough that the [inventors] appreciated the fact of their invention."). To accomplish this, Cree must offer evidence

regarding its subjective belief about its invention and "evidence that [it] timely interpreted or evaluated the results, and understood them to show the existence [of] the invention." Invitrogen, 429 F.3d at 1065 (citations omitted).

Subjective belief is evident, as Cree scientists publicly disclosed their findings concerning the G0259-3 wafer through a presentation and paper at the 1995 International Conference. See, e.g., Cree's Supplemental Br. in Supp. of Mot. for Summ. J. 15. In the paper, Cree discloses that it "recently had a breakthrough that has dramatically reduced the density of [micropipes]," as well as that "wafers from recent 4H-SiC boules . . . have areas  $> 0.5 \text{ cm}^2$  with a total line defect density of about  $1000 \text{ cm}^{-2}$ ." V. F. Tsvetkov, S. T. Allen, H. S. Kong & C. H. Carter, Jr., Recent progress in SiC crystal growth, Inst. Phys. Conf. Ser. No. 142, 19, Ex. 7 to Sternhell Decl., ECF No. 424-7 [hereinafter 1996 Cree Article]; see id. at 18 ("Our analytical review is devoted to the seeded sublimation process and all of the results reported on boule growth are from this technique."). The evidence shows that "those inventors appreciated the subject matter of the claims and the utility of the subject matter because its work leading to its reduction to practice was part of a research program specifically directed toward the purpose of the claim": creating low defect SiC material. Griffin v. Bertina, 285

F.3d 1029, 1035 (Fed. Cir. 2002); see 1996 Cree Article at 17 ("Recent results at Cree Research . . . indicate that micropipes will be reduced to a level that makes high current devices viable, and that they may be totally eliminated in the next few years.").

Similarly, it is obvious that Cree had "an objective basis for identifying the novel features of [its] invention, . . . and timely considered it," Invitrogen, 429 F.3d at 1065, since the evidence clearly and convincingly establishes that Cree enlisted Dudley to characterize the G0259-3 wafer contemporaneously with the growth of the SiC material from which that wafer was cut. See, e.g., Cree's Supplemental Br. in Supp. of Mot. for Summ. J. 15-17; Cree's Supplemental Reply in Supp. of Mot. for Summ. J. 14, ECF No. 546.<sup>11</sup>

In sum, the record is clear that Cree appreciated in 1995 that its newly grown SiC material met uniquely low defect density thresholds, and said appreciation was based on "objective evidence [that] corroborate[s]" Cree's public comments concerning that quality. Invitrogen, 429 F.3d at 1065. Fox does not dispute these facts. Rather, it seeks to obfuscate the issue by poking holes in the methodology behind Dudley's 1995 analysis of the G0259-3 wafer. Fox pursues the irrelevant goal of establishing that Dudley, in 1995, did not specifically corroborate that an axial region in the G0259-3

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<sup>11</sup> Indeed, Cree's 1996 paper includes an acknowledgment thanking Dudley for his examination. 1996 Cree Article at 22.

wafer met each defect limitations in claims 1 and 19 of the '130 patent, and thus the Cree inventors could not have appreciated in 1995 that their invention met those limitations. Fox can only avoid summary judgment by demonstrating a genuine issue of material fact, and, as already discussed, it is not necessary that Cree appreciated in 1995 that an axial region in the G0259-3 wafer met each of the defect limitations in claims 1 and 19 of the '130 patent. For the above reasons, the court **FINDS** that there is no genuine issue that Cree reduced the invention to practice before Fox did so.

#### **4. Abandonment, Suppression, or Concealment**

Cree has adduced sufficient evidence to clearly and convincingly establish prior invention, and so the court now determines whether Fox has produced evidence sufficient to create a genuine issue that Cree nonetheless abandoned, suppressed, or concealed its invention. See Dow Chem., 267 F.3d at 1339. Fox has two avenues of proof available for meeting its burden. First, Fox can produce evidence that Cree "actively abandons, suppresses, or conceals [its] invention from the public." Id. at 1342 (citations omitted). "Intentional suppression occurs when an inventor 'designedly, and with the view of applying it indefinitely and exclusively for his own profit withholds his invention from the public.'" Flex-Rest, LLC v. Steelcase, Inc., 455 F.3d 1351, 1358

(Fed. Cir. 2006) (citations omitted). Fox does not offer evidence, let alone contend that Cree "intentionally delayed [disclosure] in order to prolong the period during which the invention is maintained in secret." Fujikawa v. Wattanasin, 93 F.3d 1559, 1567 (Fed. Cir. 1996). Rather, Fox seeks to meet its burden on the second type of proof: "when abandonment, suppression, or concealment may be inferred based upon the prior inventor's unreasonable delay in making the invention publicly known." Dow Chem., 267 F.3d at 1342 (citations omitted); see, e.g., Fox's Supplemental Br. in Opp. to Mot. for Summ. J. 19. ("Fox genuinely disputes whether Cree disclosed [the invention] to the public in sufficient detail . . . ." (emphasis added)).

The patentee's burden of production for the second type can be low, as "[t]he failure to file a patent application, . . . to describe the invention in a published document, . . . or to use the invention publicly, . . . within a reasonable time after first making the invention may constitute abandonment, suppression, or concealment." Dow Chem., 267 F.3d at 1342 (citations omitted). However, in this case, there is no dispute that Cree promptly and publicly disclosed its findings concerning the low defect properties of the SiC material from which the G0259-3 wafer was cut through a presentation at the 1995 International Conference and a published paper on the subject.

Fox claims that the evidence nonetheless shows there is a genuine issue that Cree suppressed or concealed its invention because "Cree did not publish any documents or presentations disclosing the densities claimed in the '130 patent or how to make the invention." Fox's Supplemental Br. in Opp. to Mot. for Summ. J. 24. Fox once again holds Cree to an unreasonably stringent standard, which this court rejects in light of applicable law.

Fox inexplicably, and incorrectly, frames its suppression or concealment proof under the law of invalidity by anticipation, pursuant to 35 U.S.C. § 102(b).<sup>12</sup> See Fox's Supplemental Br. in Opp. to Mot. for Summ. J. 25 ("Because the 1995 Tsvetkov Paper does not disclose each and every element of the '130 patent claims, it is not an anticipatory reference."); see also Fox's Mem. in Opp. to Mot for Summ. J. 26, ECF No. 181 ("Anticipation requires that all of the elements of the invention be found in a single prior art reference."). Indeed, every case that Fox cites in purported support of finding a genuine issue of suppression or concealment concerns the standards for finding that a prior art reference invalidates a patent on the

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<sup>12</sup> "[I]nvalidity by anticipation requires that the four corners of a single, prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation." Advanced Display Sys., Inc. v. Kent State Univ., 212 F.3d 1272, 1282 (Fed. Cir. 2000).

grounds of anticipation. Anticipation is wholly inapposite, though, as Cree seeks to invalidate the '130 patent on the separate ground of prior invention, pursuant to 35 U.S.C. § 102(g)(2). Accordingly, Fox's attempt to meet its burden under the § 102(b) anticipation framework is unavailing.<sup>13</sup>

Fox also contends that Cree "delayed 9 years, until 2004, before putting the invention into the hands of the public," by using it in Cree's commercial products, this delay is unreasonable, and thus there is an inference of abandonment, suppression, or concealment. Fox's Supplemental Br. in Opp. to Mot. for Summ. J. 27. The court cannot draw this inference from the underlying facts, even when viewed in the light most favorable to Fox, because there is no genuine issue that Cree contemporaneously disclosed its invention in a presentation and paper at the 1995 International Conference, and that said paper was subsequently published. In other words, Fox's argument proceeds on a flawed premise. There is no genuine issue that Cree did not delay in "bringing knowledge of the invention to the public," Dow Chem., 267 F.3d at 1342, and so it is of no moment

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<sup>13</sup> Moreover, the court already rejected the proposition that Cree had to appreciate in 1995 that its invention specifically met each of the defect limitations in claims 1 and 19 of the '130 patent in order for Cree to reduce its invention to practice. See supra 17-19. Accordingly, it would be anomalous for the court to accept that Cree's published paper could nonetheless fail to disclose sufficiently the invention under the same unfounded standard.



that Cree did not market its public invention in its commercial products for nine years.<sup>14</sup>

The only other argument Fox offers is that there is an inference that Cree abandoned, suppressed, or concealed the invention because Cree contests Fox's infringement claim; in other words, because Cree, effectively, argues that the quality of its SiC material has decreased since disclosing the invention in 1995.<sup>15</sup> At a threshold level, the court notes that Fox cites no authority to support such an inference, nor is the court aware of any. Fox bears the burden "to produce evidence sufficient to create a genuine issue of material fact as to whether the prior inventor abandoned, suppressed, or concealed the invention," Dow Chem., 267 F.3d at 1339 (emphasis added), and "[a]rgument is not evidence upon which to base a denial of summary judgment.'" Glaverbel Societe Anonyme v. Northlake Mktg. & Supply, Inc., 45 F.3d 1550, 1562 (Fed. Cir. 1995) (citations omitted). Fox cannot meet its burden by merely pointing out that Cree contests its infringement claim. Cf. id. ("There must be

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<sup>14</sup> Fox does not cite any cases in support of such a blanket commercialization requirement, nor is the court aware of any. The standard is public disclosure. Commercialization is merely one route an inventor can employ to publicly disclose an invention. See, e.g., Flex-Rest, 455 F.3d at 1359-60 (addressing disclosure by commercializing and disclosure by filing a patent application).

<sup>15</sup> Fox originally argued this in opposition, but did not renew or recast the argument in its supplemental opposition brief.

sufficient substance, other than attorney argument, to show that the issue requires trial." ). Furthermore, Fox does not adduce any evidence that Cree abandoned, suppressed, or concealed the invention since it was first publicly disclosed. In fact, the only evidence Fox has come forward with in opposing Cree's Summary Judgment Motion purportedly demonstrates that Cree products satisfy the defect limitations in claims 1 and 19 of the '130 patent, thereby supporting an inference that Cree did not abandon the invention. See Fox's Supplemental Br. in Opp. to Mot. for Summ. J. 14-18.

In sum, the record is clear that Cree publicly disclosed its invention "within a reasonable time after first making the invention," Dow Chem., 267 F.3d at 1342, and that Fox does not genuinely dispute this fact. Moreover, Fox has not produced any evidence that allows the court to infer Cree nonetheless abandoned, suppressed, or concealed the invention. Rather, Fox once again seeks to obfuscate the issue with incongruous legal arguments. Accordingly, Fox cannot make a showing sufficient to establish the existence of an element essential to its case, and on which it would bear the burden of proof at trial. For the above reasons, the court **FINDS** that there is no genuine issue regarding abandonment, suppression, or concealment -- Cree did not abandon, suppress, or conceal its prior invention.

## 5. Summary

Because there is no genuine issue of material fact, and Cree has produced clear and convincing evidence that it made the low defect SiC invention prior to Fox, and Fox has not produced any evidence that Cree abandoned, suppressed, or concealed the invention, the court **FINDS** that claims 1 and 19 of the '130 patent are invalid under 35 U.S.C. § 102(g)(2). See Dow Chem., 267 F.3d at 1344. Accordingly, Cree is entitled to judgment as a matter of law on its counterclaim seeking a declaration that the '130 patent is invalid.

### B. Non-Infringement

"Invalidity is a complete defense to infringement and . . . resolves all issues that are meaningful in [a] case." Lough v. Brunswick Corp., 86 F.3d 1113, 1123 (Fed. Cir. 1996) (remarking that "[n]o further public interest is served by [] resolving an infringement question after a determination that the patent is invalid"). The asserted claims of the '130 patent are invalid, and so "even if [Cree] did infringe, . . . no judgment of liability could be entered." Sandt Tech., Ltd. v. Resco Metal & Plastics Corp., 264 F.3d 1344, 1356 (Fed. Cir. 2001) (citing B.F. Goodrich Co. v. Aircraft Braking Sys., Corp., 72 F.3d 1577, 1583 (Fed. Cir. 1996)). Accordingly, the court **DISMISSES** Fox's claim for infringement of the '130 patent, **DISMISSES** Cree's counterclaim seeking a declaration

that Cree does not infringe the '130 patent, and **DENIES** Cree's Summary Judgment, as **MOOT**, insofar as it seeks judgment of non-infringement of the '130 patent.

#### **VI. Conclusion**

For the above reasons, the court **GRANTS** Cree's Summary Judgment Motion on its counterclaim seeking a declaration that the '130 patent is invalid. Accordingly, the court **DISMISSES** Count II of the Complaint, Cree's counterclaim seeking a declaration that the '130 patent is not infringed, and Cree's counterclaim seeking a declaration that the '130 patent is unenforceable, as **MOOT**. Furthermore the court **DENIES** Cree's Summary Judgment Motion, as **MOOT**, insofar as it seeks judgments of non-infringement of both the '130 and '026 patents. See Fox Group, 2011 WL 2963580, at \*3.<sup>16</sup> As all of Fox's claims and Cree's counterclaims are either dismissed or decided, any motions concerning trial issues are **MOOT**. Accordingly, the parties' in limine motions, Fox's Motion to Bifurcate, and Cree's Motion to Close Courtroom Proceedings are **DENIED** as **MOOT**.

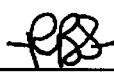
The Clerk is **DIRECTED** to enter judgment for Cree on its counterclaim seeking a declaration that the '130 patent is invalid in accordance with this Opinion and Final Order. The Clerk is

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<sup>16</sup> The court previously entered judgment of non-infringement of the '026 patent for Cree and dismissed Cree's counterclaims related to the '026 patent. Fox Group, 2011 WL 2963580, at \*3; see supra 4.

further **DIRECTED** to enter judgment dismissing Count II of the Complaint, Cree's counterclaim seeking a declaration that the '130 patent is not infringed, and Cree's counterclaim seeking a declaration that the '130 patent is unenforceable, all in accordance with this Opinion and Final Order. Finally, the Clerk is **DIRECTED** to forward a copy of this Opinion and Final Order to counsel for the parties, and to close the case on this court's docket.

IT IS SO ORDERED.

/s/  
Rebecca Beach Smith  
United States District Judge   
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REBECCA BEACH SMITH  
UNITED STATES DISTRICT JUDGE

Norfolk, Virginia  
August 8, 2011